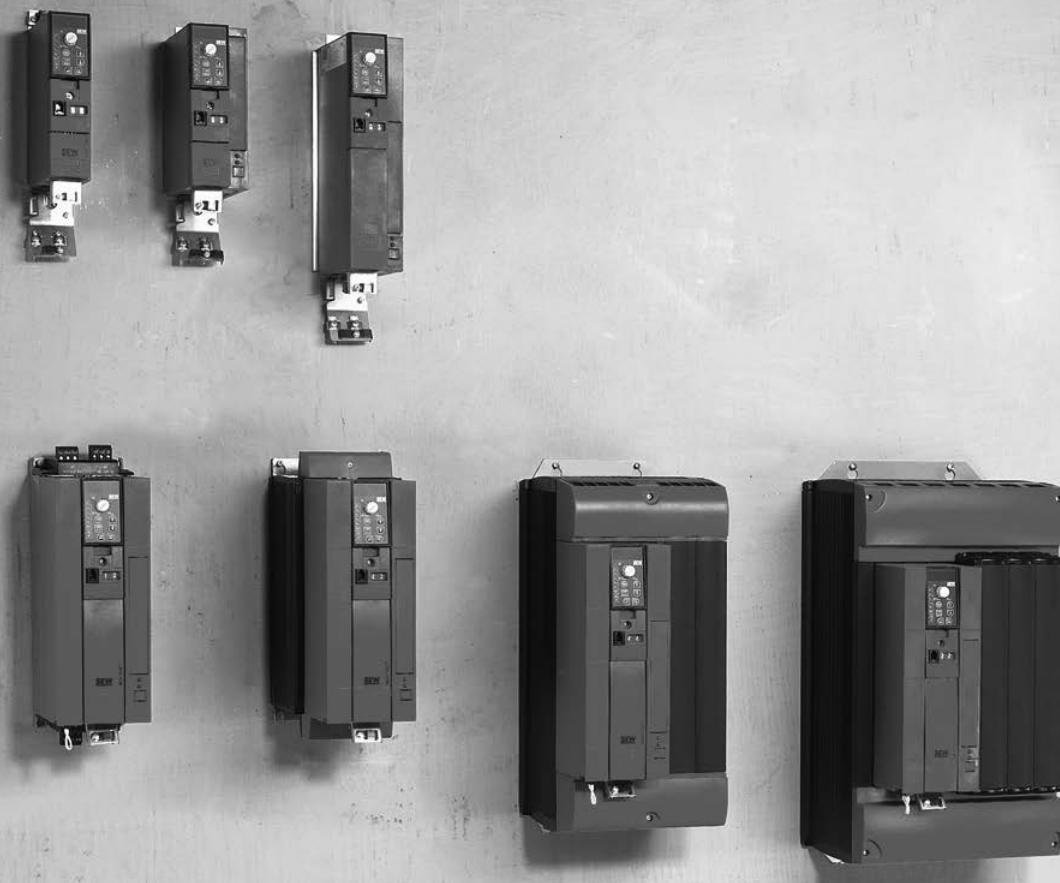




**SEW**  
**EURODRIVE**



**MOVITRAC® B**  
**FSC11B Communication Interface**  
**FIO11B Analog Module / FIO21B Digital Module**

Edition 02/2009  
16793226 / EN

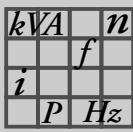
**Operating Instructions**





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## 1 Important Information

### 1.1 How to use the operating instructions

The operating instructions are an integral part of the product and contain important information for operation and service. The operating instructions are written for all employees who assemble, install, startup, and service this product.

The operating instructions must be legible and accessible at all times. Make sure that staff responsible for the plant and its operation, as well as persons who work independently on the unit, have read the operating instructions carefully and understood them. If you are unclear about any of the information in this documentation, or if you require further information, contact SEW-EURODRIVE.

#### 1.1.1 Text conventions

- Text in software user interfaces (menu items, buttons, etc.) is shown in square brackets, e.g.: "Click the [Start] button."
- Parameter names are written in italics, e.g.: "Write down the values of variables *H509 ACT.POS.ABS.*".
- The display of the FBG11B keypad is indicated by a font with fixed character width, e.g.: "The display shows **Stop**."



## 1.2 Structure of the safety notes

The safety notes in these operating instructions are designed as follows:

Pictogram	SIGNAL WORD
	<p>Type and source of danger.</p> <p>Possible consequence(s) if the safety notes are disregarded.</p> <ul style="list-style-type: none"> <li>• Measure(s) to prevent the danger.</li> </ul>

Pictogram	Signal word	Meaning	Consequences if disregarded
<p>Example:</p> <p></p> <p>General danger</p> <p></p> <p>Specific danger, such as electric shock</p>		DANGER	Imminent danger
		WARNING	Possible dangerous situation
		CAUTION	Possible dangerous situation
		NOTICE	Possible damage to property
	<b>TIP</b>	Useful information or tip. Simplifies the handling of the drive system.	

## 1.3 Rights to claim under warranty

A requirement of fault-free operation and fulfillment of any rights to claim under limited warranty is that you adhere to the information in the operating instructions. Therefore, read the operating instructions before you start working with the unit.

## 1.4 Exclusion of liability

You must comply with the information contained in these operating instructions to ensure safe operation of MOVITRAC® B frequency inverters and to achieve the specified product characteristics and performance requirements. SEW-EURODRIVE does not assume liability for injury to persons or damage to equipment or property resulting from non-observance of these operating instructions. In such cases, any liability for defects is excluded.



## 2 Safety Notes

The following basic safety notes must be read carefully to prevent injury to persons and damage to property. The operator must ensure that the basic safety notes are read and observed. Make sure that persons responsible for the plant and its operation, as well as persons who work independently on the unit, have read through the operating instructions carefully and understood them. If you are unclear about any of the information in this documentation, or if you require further information, please contact SEW-EURODRIVE.

### 2.1 Preliminary information

The following safety notes predominantly refer to the use of frequency inverters. Additionally, when using drives with motors or gearmotors, observe the corresponding safety notes in the respective operating instructions.

Please also observe the supplementary safety notes in the individual sections of this publication.

### 2.2 General



#### **DANGER**

During operation, frequency inverters can have live, bare parts according to their degree of protection.

Severe or fatal injuries.

- All work related to transportation, storage, setup/mounting, connection, startup, maintenance and repair may only be carried out by qualified personnel, in strict observation of:
  - The relevant detailed operating instructions
  - The warning and safety signs on the motor/gearmotor
  - All other project planning documents, operating instructions and wiring diagrams related to the drive
  - The specific regulations and requirements for the system
  - The national/regional regulations governing safety and the prevention of accidents
- Never install damaged products.
- Immediately report any damages to the shipping company.

Removing covers without authorization, improper use as well as incorrect installation or operation may result in severe injuries to persons or damage to property.

This document includes further information.



## 2.3 Target group

Any mechanical work may only be performed by adequately qualified personnel. Qualified personnel in this context are persons who are familiar with the setup, mechanical installation, trouble shooting and maintenance for this product. Further, they are qualified as follows:

- Training in mechanical engineering, e.g. as a mechanic or mechatronics technician (final examinations must have been passed).
- They are familiar with these operating instructions.

Any electronic work may only be performed by adequately qualified electricians. Qualified electricians in this context are persons who are familiar with the electronic installation, startup, trouble shooting and maintenance for this product. Further, they are qualified as follows:

- Training in electrical engineering, e.g. as an electrician or mechatronics technician (final examinations must have been passed).
- They are familiar with these operating instructions.

All work in further areas of transportation, storage, operation and waste disposal may be carried out only by persons who are trained appropriately.

## 2.4 Designated use

Frequency inverters are components for controlling asynchronous AC motors. Frequency inverters are components intended for installation in electrical systems or machines. Never connect capacitive loads. Operation with capacitive loads results in over voltages and may destroy the unit.

The following standards apply, if the frequency inverters are marketed in the EU/EFTA:

- In case of installation in machines, startup of the drive inverters (meaning the start of proper use) is prohibited until it is determined that the machine meets the requirements stipulated in the EC Directive 98/37/EC (machine directive); observe EN 60204.
- Startup (i.e. the start of designated use) is only permitted under observance of the EMC (2004/108/EC) directive.
- The frequency inverters comply with the requirements of the Low Voltage Directive 2006/95/EC. The harmonized standards of the EN 61800-5-1/DIN VDE T105 series in connection with EN 60439-1/VDE 0660 part 500 and EN 60146/VDE 0558 are applied to these frequency inverters.

Observe the technical data and the connection requirements specified on the nameplate and the operating instructions.

### 2.4.1 Safety functions

Frequency inverters from SEW-EURODRIVE must not perform any safety functions unless the inverters are subordinate to other safety systems.

Use higher-level safety systems to ensure protection of equipment and personnel.



## 2.5 Other applicable documentation

When using the "Safe stop" function, you must observe the following publications:

- MOVITRAC® B / Safe Disconnection – Conditions
- MOVITRAC® B / Safe Disconnection – Applications

These publications are available via **Documentation\Software\CAD** on the SEW-EURODRIVE homepage.

## 2.6 Transport

Immediately upon receipt, inspect the shipment for any damage that may have occurred during transportation. Inform the shipping company immediately in the event of damage. It may be necessary to preclude startup. Observe the climate conditions according to chapter "General technical data".

## 2.7 Extended storage

Observe the notes in section "Extended storage".

## 2.8 Installation/assembly

The units must be installed and cooled according to the regulations and specifications in this documentation.

Protect the frequency inverters from excessive strain. Do not twist any components and do not modify the insulation spaces. Do not touch any electronic components or contacts.

Frequency inverters contain components that can easily be damaged by electrostatic energy and improper handling. Electric components must not be mechanically damaged or destroyed.

The following applications are prohibited unless the unit is explicitly designed for such use:

- Use in potentially explosive atmospheres.
- Use in areas exposed to harmful oils, acids, gases, vapors, dust, radiation, etc. (frequency inverter may only be operated in climate class 3K3 to EN 60721-3-3)
- Use in non-stationary applications which are subject to mechanical vibration and impact loads in excess of the requirements in EN 61800-5-1.



## **2.9 Electrical connection**

Observe the applicable national accident prevention guidelines when working on live frequency inverters (e.g. BGV A3 for Germany).

During installation, observe the specifications regarding cable cross sections, fusing and protective conductor connection. This publication contains additional information.

In this documentation, you will find notes on EMC compliant installation, such as shielding, grounding, arrangement of filters and routing of lines. The manufacturer of the system or machine is responsible for maintaining the limits established by EMC legislation.

Protective measures and protection devices must comply with the regulations in force (e.g. EN 60204 or EN 61800-5-1).

Ground the unit.

## **2.10 Safe disconnection**

The unit meets all requirements for safe disconnection of power and electronic connections in accordance with EN 61800-5-1. All connected circuits must also satisfy the requirements for safe disconnection.

## **2.11 Startup/operation**

Systems with integrated frequency inverters must be equipped with additional monitoring and protection devices, as applicable, according to the relevant safety guidelines and regulations, such as legislation governing technical equipment, accident prevention regulations, etc.

Do not touch live components or power connections until 10 minutes after disconnecting the frequency inverters from the supply voltage because there may still be some charged capacitors. Observe the corresponding labels on the frequency inverter.

Keep all covers and doors closed during operation.

The fact that the status LED and other display elements are no longer illuminated does not indicate that the unit has been disconnected from the mains and no longer carries any voltage.

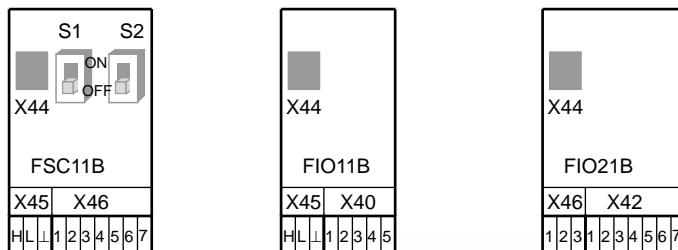
Mechanical blocking or safety functions inside the unit may result in the motor coming to a standstill. Eliminating the cause of the problem or performing a reset may result in the drive re-starting automatically. If, for safety reasons, this is not permitted for the driven machine, disconnect the unit from the supply system before correcting the error.



### 3 Installation

#### 3.1 *Installing FSC11B / FIO11B / FIO21B*

You can enhance the basic units using the FSC11B, FIO11B, and FIO21B modules.



Connection/unit	FSC11B	FIO11B	FIO21B
RS-485 service interface X44	yes	yes	yes
RS-485 terminal connection X45	yes	yes	no
SBus connection X46	yes	no	yes
Analog input/output X40	no	yes	no
Binary inputs X42	no	no	yes

##### 3.1.1 Mounting and installation on FSC11B / FIO11B / FIO21B

Always attach the option to the unit with the screw that is included in the delivery. For size 0, mount the spacer bolt first. The bolt is already installed in sizes 1 and higher. Fitting the screw secures the high-frequency EMC connection between the basic unit and the option.

Function	Termin-al	Description		Data	FSC11B	FIO11B	FIO21B
Service interface	X44	Via RJ10 plug connector		Only for service purposes Maximum cable length 3 m (10 ft)	yes	yes	yes
RS-485 interface	X45:H	ST11: RS-485+			yes	yes	no
	X45:L	ST12: RS-485-					
	X45:⊥	GND: Reference potential					



Function	Terminal	Description	Data	FSC11B	FIO11B	FIO21B
System bus	X46:1	SC11: SBus high	CAN bus to CAN specification 2.0, parts A and B Max. 64 stations	yes <sup>1)</sup>	no	yes <sup>2)</sup>
	X46:2	SC12: SBus Low				no
	X46:3	GND: Reference potential				
	X46:4	SC21: SBus High				
	X46:5	SC22: SBus Low				
	X46:6	GND: Reference potential				
DC 24 V	X46:7	24VIO: Auxiliary voltage / external voltage supply		yes	no	no
Analog input	X40:1	AI2: Voltage input	-10 – +10 V $R_i > 40 \text{ k}\Omega$ Resolution 10 bit Sampling time 5 ms	no	yes	yes
	X40:2	GND: Reference potential				
Analog output	X40:3	GND: Reference potential	0 – +10 V $I_{max} = 2 \text{ mA}$ 0 (4) – 20 mA Resolution 10 bit Sampling time 5 ms Short-circuit proof, protected against external voltage up to 30 V	no	yes	yes
	X40:4	AOV1: Voltage output				
	X40:5	AOI1: Current output				
Binary inputs	X42:1	DI10	$R_i = 3 \text{ k}\Omega$ , $I_E = 10 \text{ mA}$ , sampling time 5 ms, PLC-compatible	no	no	yes
	X42:2	DI11				
	X42:3	DI12				
	X42:4	DI13				
	X42:5	DI14				
	X42:6	DI15				
	X42:7	DI16				

1) Terminating resistor 120  $\Omega$  can be activated via DIP switch

2) Bus termination possible with enclosed 120  $\Omega$  resistor.

The DC 24 V function of X46:7 is identical to X12:8 of the basic unit. All GND terminals of the unit are connected to each other and to PE.

#### Cable specification

- Use a 4-core twisted and shielded copper cable (data transmission cable with braided copper shield). The cable must meet the following specifications:
  - Cable cross-section 0.25 to 0.75 mm<sup>2</sup> (AWG 23 - AWG 18)
  - Cable resistance 120  $\Omega$  at 1 MHz
  - Capacitance per unit length  $\leq 40 \text{ pF/m}$  at 1 kHz

Suitable cables include CAN bus or DeviceNet cables.

#### Connecting the shield

- Connect the shield to the electronics shield clamp on the inverter or master controller and make sure it is connected over a wide area at both ends.
- There is no need for a ground connection between MOVITRAC® B and gateways, or MOVITRAC® B and MÖVITRAC® B with shielded cables. A 2-core cable is permitted in this case.
- When connecting MOVIDRIVE® B and MOVITRAC® B, be aware that the electrical isolation is eliminated between the reference potential DGND and ground in MOVIDRIVE® B.

**CAUTION****Potential displacement**

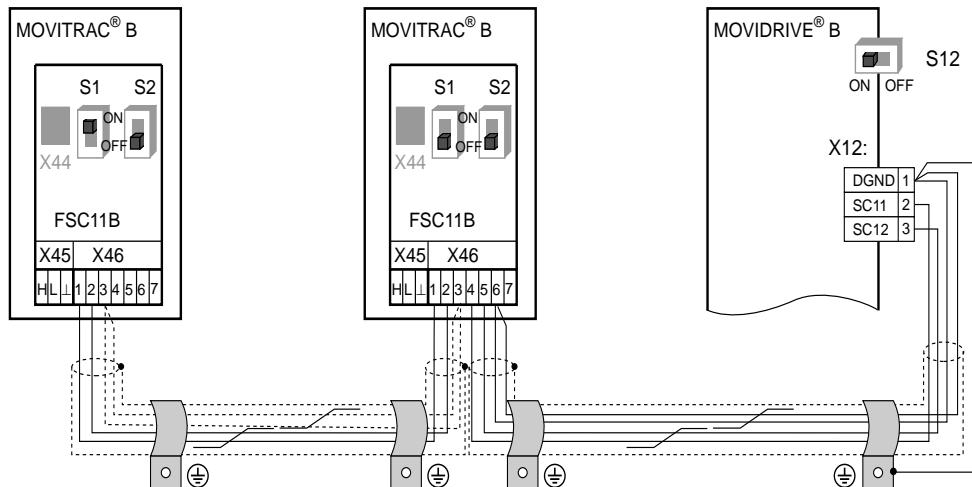
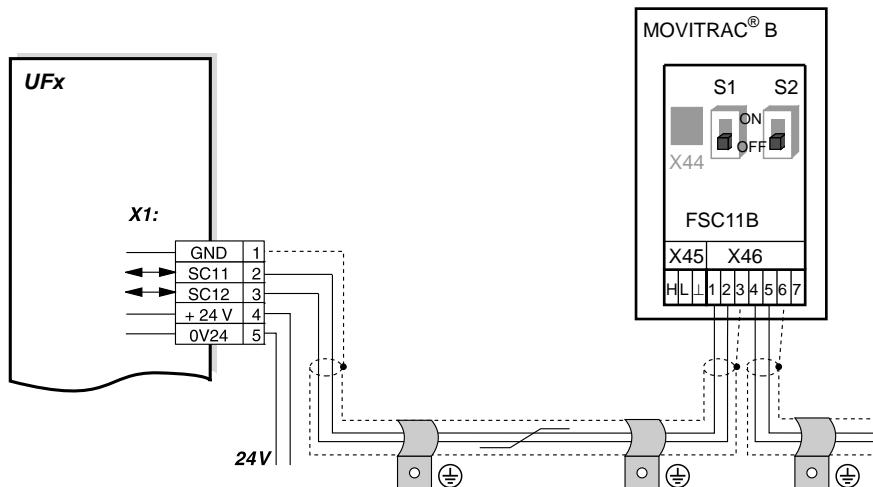
Possible consequences include malfunctions that could lead to irreparable damage to the unit.

- There must not be any potential displacement between the connected units. Take appropriate measures to avoid potential displacement, such as connecting the unit ground connectors using a separate cable.

### 3.1.2 Installing the system bus (SBus) to FSC11B

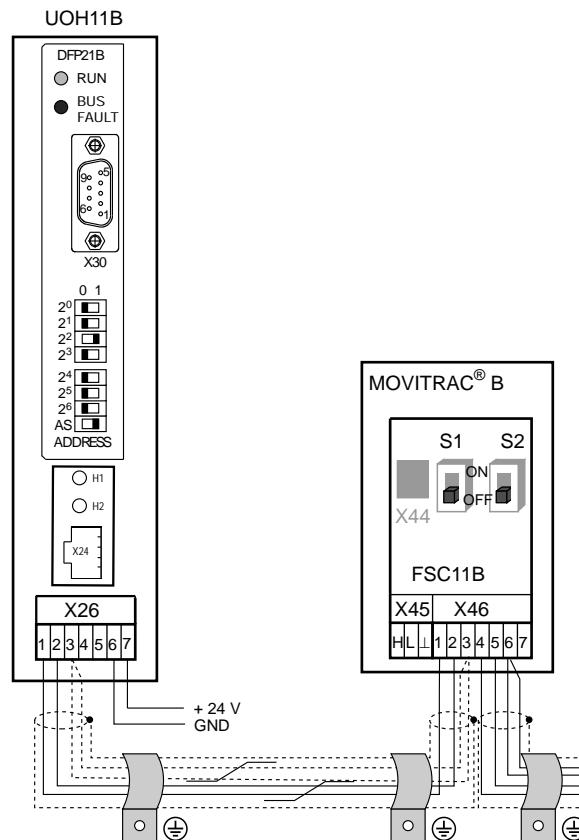
Max. 64 CAN bus stations can be addressed via system bus (SBus). The SBus supports transmission technology compliant with ISO 11898.

<b>S1</b>	<b>S2</b>	<b>SC11/SC12</b>	<b>SC21/SC22</b>
off	off	CAN1	CAN1
on	off	CAN1 concluded	–
X	on	Reserved	

**MOVITRAC® B system bus connection****MOVITRAC® B system bus connection with UFx**



MOVITRAC® B system bus connection with DFx/UOH11B gateways or DFx integrated in MOVITRAC® B



#### Cable length

- The permitted total cable length depends on the baud rate setting of the SBus (P884):
  - 125 kBaud: 320 m (1050 ft)
  - 250 kBaud: 160 m (525 ft)
  - **500 kBaud: 80 m (260 ft)**
  - 1000 kBaud: 40 m (130 ft)
- You must use shielded cables.

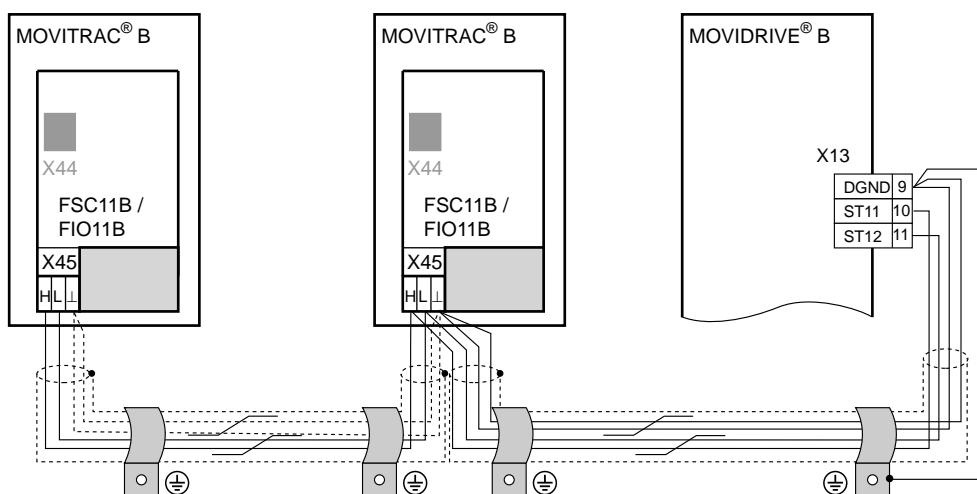
	<b>TIP</b> Terminating resistor: Switch on the system bus terminating resistor (S1 = ON) at the start and end of the system bus connection. Switch off the terminating resistor on the units in between (S1 = OFF). Certain units have a permanently integrated terminating resistor that cannot be switched off. This is the case for UFx and DFx/UOH. These gateways form the end of the physical line. <b>Do not connect any external terminating resistors.</b>
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#### 3.1.3 Installing RS-485 interface to FSC11B

The RS-485 interface can be used for connecting max. 32 MOVITRAC® units or 31 MOVITRAC® units and a higher-level controller (PLC).

MOVITRAC® B RS-485 connection



Cable length

- The permitted total cable length is 200 m.
- You must use shielded cables.

	TIP
	Terminating resistor: Dynamic terminating resistors are installed. <b>Do not connect any external terminating resistors.</b>

#### 3.1.4 Wiring the FIO11B analog module

Bipolar analog input AI2	Unipolar analog input AI2	Current analog output AOC1	Voltage analog output AOV1																																																																																
<table border="1"> <tr> <td>X45</td> <td>X40</td> </tr> <tr> <td>RS-485+</td> <td></td> </tr> <tr> <td>RS-485-</td> <td></td> </tr> <tr> <td>GND</td> <td></td> </tr> <tr> <td>A12</td> <td></td> </tr> <tr> <td>1</td> <td>2</td> </tr> <tr> <td>2</td> <td>3</td> </tr> <tr> <td>3</td> <td>4</td> </tr> <tr> <td>4</td> <td>5</td> </tr> <tr> <td>5</td> <td></td> </tr> </table> <p>HL</p> <p>External power supply: -10 V and +10 V</p> <p>GND</p>	X45	X40	RS-485+		RS-485-		GND		A12		1	2	2	3	3	4	4	5	5		<table border="1"> <tr> <td>X45</td> <td>X40</td> </tr> <tr> <td>RS-485+</td> <td></td> </tr> <tr> <td>RS-485-</td> <td></td> </tr> <tr> <td>GND</td> <td></td> </tr> <tr> <td>A12</td> <td></td> </tr> <tr> <td>1</td> <td>2</td> </tr> <tr> <td>2</td> <td>3</td> </tr> <tr> <td>3</td> <td>4</td> </tr> <tr> <td>4</td> <td>5</td> </tr> <tr> <td>5</td> <td></td> </tr> </table> <p>HL</p> <p>External power supply: +10 V or X10:1</p> <p>GND</p>	X45	X40	RS-485+		RS-485-		GND		A12		1	2	2	3	3	4	4	5	5		<table border="1"> <tr> <td>X45</td> <td>X40</td> </tr> <tr> <td>RS-485+</td> <td></td> </tr> <tr> <td>RS-485-</td> <td></td> </tr> <tr> <td>GND</td> <td></td> </tr> <tr> <td>A12</td> <td></td> </tr> <tr> <td>1</td> <td>2</td> </tr> <tr> <td>2</td> <td>3</td> </tr> <tr> <td>3</td> <td>4</td> </tr> <tr> <td>4</td> <td>5</td> </tr> <tr> <td>5</td> <td></td> </tr> </table> <p>HL</p> <p>External power supply: A (mA) and RL</p> <p>GND</p> <p><math>R_L \leq 750 \Omega</math></p>	X45	X40	RS-485+		RS-485-		GND		A12		1	2	2	3	3	4	4	5	5		<table border="1"> <tr> <td>X45</td> <td>X40</td> </tr> <tr> <td>RS-485+</td> <td></td> </tr> <tr> <td>RS-485-</td> <td></td> </tr> <tr> <td>GND</td> <td></td> </tr> <tr> <td>A12</td> <td></td> </tr> <tr> <td>1</td> <td>2</td> </tr> <tr> <td>2</td> <td>3</td> </tr> <tr> <td>3</td> <td>4</td> </tr> <tr> <td>4</td> <td>5</td> </tr> <tr> <td>5</td> <td></td> </tr> </table> <p>HL</p> <p>External power supply: V</p>	X45	X40	RS-485+		RS-485-		GND		A12		1	2	2	3	3	4	4	5	5	
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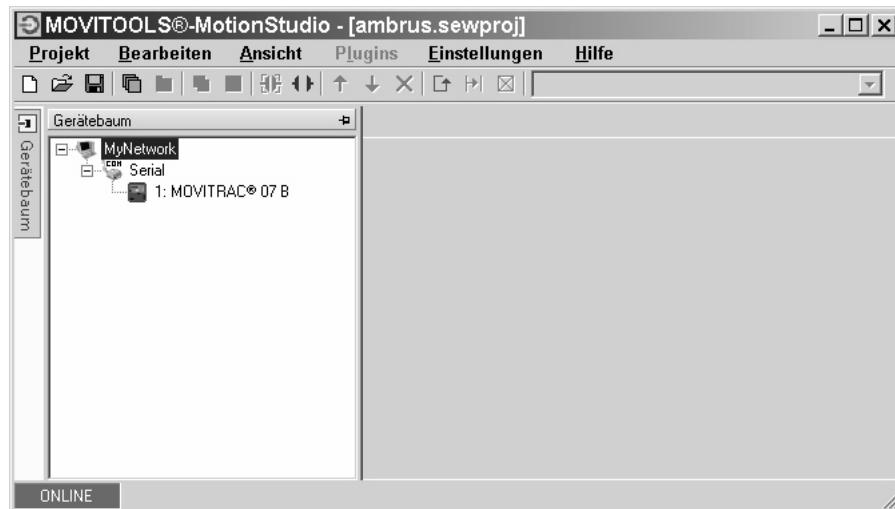
## 4 Startup

### 4.1 Startup with PC and MOVITOOLS® MotionStudio

Start MOVITOOLS® MotionStudio in the Windows start menu:

Programs / SEW / MOVITOOLS MotionStudio 5.x / MotionStudio 5.x

Press the MOVITOOLS® MotionStudio [Scan] button to list all connected units in the unit tree.

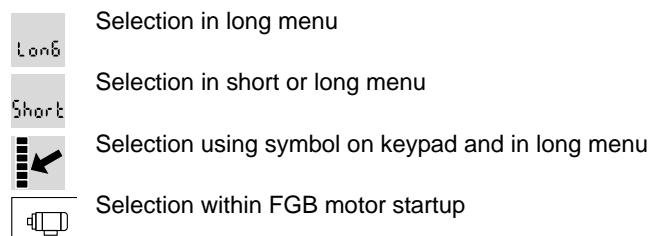


You can perform a startup by right-clicking on one of the units. You find additional information in the online help.



## 4.2 Parameter list

All parameters that can also be displayed and edited using the keypad are indicated as follows in the "FBG" (keypad) column:



If a choice is offered, the factory setting is indicated in **bold**.

No.	FBG	Index dec.	Name	Range / factory setting	Value after startup	
			Display	MOVITOOLS® MotionStudio		
<b>0..</b>			<b>Display values (read only)</b>			
<b>00.</b>			<b>Process values</b>			
000		8318	Speed (signed)	[rpm]		
001		8501	User display for DBG11B	[Text]		
002		8319	Frequency (signed)	[Hz]		
004		8321	Output current (value)	[% I <sub>N</sub> ]		
005		8322	Active current (signed)	[% I <sub>N</sub> ]		
008		8325	DC link voltage	[V]		
009		8326	Output current	[A]		
<b>01.</b>			<b>Status displays</b>			
010		8310	Inverter status	[Text]		
011		8310	Operating state	[Text]		
012		8310	Error status	[Text]		
013		8310	Current parameter set	Current parameter set		
014		8327	Heat sink temperature	[°C]		
<b>02.</b>			<b>Analog setpoints</b>			
020		8331	Analog input AI1	[V]		
021		8332	Analog input AI2 (optional)	[V]		
<b>03.</b>			<b>Binary inputs</b>			
030		8844	Binary input DI00	<b>Error reset</b>		
031		8335	Binary input DI01	CW / halt (fixed assignment)		
032		8336	Binary input DI02	<b>CCW/halt</b>		
033		8337	Binary input DI03	<b>Enable/stop</b>		
034		8338	Binary input DI04	<b>n11/n21</b>		
035		8339	Binary input DI05	<b>n12/n22</b>		
039		8334	Binary inputs DI00 – DI05	Collective display of binary inputs		



No.	FBG	Index dec.	Name	Range / factory setting	Value after startup		
				Display	MOVITOOLS® MotionStudio		
<b>04.</b>			<b>Binary inputs option</b>				
040			Binary input DI10		<b>No function</b>		
041			Binary input DI11		<b>No function</b>		
042			Binary input DI12		<b>No function</b>		
043			Binary input DI13		<b>No function</b>		
044			Binary input DI14		<b>No function</b>		
045			Binary input DI15		<b>No function</b>		
046			Binary input DI16		<b>No function</b>		
048	Long	8348	Binary inputs DI10 – DI15		Collective display of binary inputs		
<b>05.</b>			<b>Binary outputs</b>				
051		8349	Binary output DO01		<b>/fault</b>		
052		8349	Binary output DO02		<b>Brake released</b>		
053		8349	Binary output DO03		<b>Ready</b>		
059	Long	8349	Binary outputs DO01 – DO03		Collective display of binary outputs		
<b>07.</b>			<b>Unit data</b>				
070		8301	Unit type		[Text]		
071		8361	Rated output current		[A]		
076		8300	Firmware of basic unit		[Part number and version]		
077		–	DBG firmware		Only in DBG60B		
<b>08.</b>			<b>Fault memory</b>				
080 – 084	Long	8366 – 8370	Fault t-0 – t-4	Fault code	Background information for previous faults.		
<b>09.</b>			<b>Bus diagnostics</b>				
094		8455	PO 1 setpoint		[hex]		
095	Long	8456	PO 2 setpoint		[hex]		
096		8457	PO 3 setpoint		[hex]		
097		8458	PI 1 actual value		[hex]		
098		8459	PI 2 actual value		[hex]		
099		8460	PI 3 actual value		[hex]		



## Startup

### Parameter list

No.	FBG	Index dec.	Name	Range / factory setting	Value after startup		
			Display	MOVITOOLS® MotionStudio			
1..			<b>Setpoints / ramp generators</b> (on FBG only parameter set 1)				
10..			<b>Setpoint selection / frequency input</b>				
100	Short	8461	Setpoint source	0 1 2 4 6 7 8 9 10 11 14	Bipolar / fixed setpoint <b>Unipolar / fixed setpoint</b> RS-485 / fixed setpoint Motor potentiometer/fixed setpoint Fixed setpoint + AI1 Fixed setpoint* + AI1 MASTER SBus1 MASTER RS-485 SBus 1 / Fixed setpoint Frequency setpoint input / Fixed set-point Bipolar AI2 / Fixed setpoint		
101			Control signal source	0 1 3 4	<b>Terminals</b> RS-485 SBus 1 3-wire control		
102			8840	Frequency scaling	0.1 – <b>10</b> – 120.00 [kHz]		
103			10247.15	FI1 reference	0 1	$n_{max}$ $n_{reference}$	
104			10247.10	Setpoint reference speed $n_{reference}$	0 – <b>3000</b> – 6000 rpm		
105			10416.1	Wire breakage detection	0 2 4 7	No response Immediate stop/fault Rapid stop/fault <b>Rapid stop/warning</b>	
106			10247.11	FI1 characteristic curve x1	0 – 100 %		
107			10247.12	FI1 characteristic curve y1	–100 % – <b>0</b> – +100 %		
108			10247.13	FI1 characteristic curve x2	0 – <b>100</b> %		
109			10247.14	FI1 characteristic curve y2	–100 % – 0 – <b>+100</b> %		



No.	FBG	Index dec.	Name	Range / factory setting	Value after startup		
			Display	MOVITOOLS® MotionStudio			
11.			<b>Analog input 1 (0 – 10 V)</b>				
110		8463	AI1 scaling	0.1 – <b>1</b> – 10			
112	Short	8465	AI1 operating mode	1 5 6 7 8 9 <b>10 V, reference maximum speed</b> 0 – 20 mA, reference maximum speed 4 – 20 mA, reference maximum speed 0 – 10 V, n-reference 0 – 20 mA, n-reference 4 – 20 mA, n-reference			
113		8466	AI1 voltage offset	–10 V – <b>0</b> – +10 V			
116		10247.6	AI1 characteristic curve x1	<b>0</b> – 100 %			
117		10247.7	AI1 characteristic curve y1	–100 % – <b>0</b> – +100 %			
118		10247.8	AI1 characteristic curve x2	<b>0</b> – 100 %			
119		10247.9	AI1 characteristic curve y2	–100 % – 0 – <b>+100 %</b>			
12.			<b>Analog input AI2 / FBG speed control module (option)</b>				
120		8469	AI2 operating mode	0 1 2 <b>No function</b> 0 – ±10 V + setpoint 0 – 10 V current limit			
121	Long	8811	Addition FBG setpoint control module	0 1 2 <b>Off</b> On On (without fixed setpoint)			
122		8799	Direction of rotation FBG manual operation	0 1 2 <b>Unipolar CW</b> Unipolar CCW Bipolar CW and CCW			
126		10247.1	AI2 characteristic curve x1	–100 % – <b>0</b> – +100 % (–10 V – <b>0</b> – +10 V)			
127		10247.2	AI2 characteristic curve y1	–100 % – <b>0</b> – +100 % (–n <sub>max</sub> – <b>0</b> – +n <sub>max</sub> / 0 – I <sub>max</sub> )			
128	Long	10247.3	AI2 characteristic curve x2	–100 % – 0 – <b>+100 %</b> (–10 V – 0 – <b>+10 V</b> )			
129		10247.4	AI2 characteristic curve y2	–100 % – 0 – <b>+100 %</b> (–n <sub>max</sub> – 0 – +n <sub>max</sub> / 0 – I <sub>max</sub> )			
13. / 14.			<b>Speed ramps 1 / 2</b>				
130 / 140		8807 / 9264	Ramp t11/t21 up	0.1 – <b>2</b> – 2000 [s]			
131 / 141	Long	8808 / 9265	Ramp t11 / t21 down	0.1 – <b>2</b> – 2000 [s]			
134 / 144		8474 / 8482	Ramp t12 / t22	0.1 – <b>10</b> – 2000 [s]			
135 / 145	Long	8475 / 8483	S pattern t12 / t22	0 1 2 3 <b>Off</b> Weak Medium Strong			
136 / 146		8476 / 8484	Stop ramp t13 / t23	0.1 – <b>2</b> – 20 [s]			
139 / 149		8928 / 8929	Ramp monitoring 1 / 2	0 1 <b>YES</b> NO			



## Startup

### Parameter list

No.	FBG	Index dec.	Name	Range / factory setting	Display	MOVITOOLS® MotionStudio	Value after startup		
<b>15.</b>			<b>Motor potentiometer function</b>						
150	Lang6	8809	Ramp t3 up = down	0.2 – <b>20</b> – 50 [s]					
152		8488	Save last setpoint	Off On	Off On				
<b>16. / 17.</b>			<b>Fixed setpoints</b>						
160 / 170	Lang6	8489 / 8492	Internal setpoint n11 / n21	0 – <b>150</b> – 5000 [rpm]					
161 / 171		8490 / 8493	Internal setpoint n12 / n22	0 – <b>750</b> – 5000 [rpm]					
162 / 172		8491 / 8494	Internal setpoint n13 / n23	0 – <b>1500</b> – 5000 [rpm]					
163 / 173		8814 / 8817	n11/n21 PI controller	0 – <b>3</b> – 100 [%]					
164 / 174		8815 / 8818	n12/n22 PI controller	0 – <b>15</b> – 100 [%]					
165 / 175		8816 / 8819	n13/n23 PI controller	0 – <b>30</b> – 100 [%]					
<b>2..</b>			<b>Controller parameter</b>						
<b>25.</b>			<b>PI controller</b>						
250	Lang6	8800	PI controller	<b>0</b> 1 2	Off Normal Inverted				
251		8801	P-gain	0 – <b>1</b> – 64					
252		8802	I-component	0 – <b>1</b> – 2000 [s]					
253		8465	PI actual value mode	<b>1</b> 5 6 7 8 9	<b>10 V, reference maximum speed</b> 0 – 20 mA, reference maximum speed 4 – 20 mA, reference maximum speed 0 – 10 V, n-reference 0 – 20 mA, n-reference 4 – 20 mA, n-reference				
254		8463	PI actual value scaling	0.1 – <b>1.0</b> – 10.0					
255		8812	PI actual value offset	<b>0.0</b> – 100.0 [%]					
<b>3..</b>			<b>Motor parameters</b> (on FBG only parameter set 1)						
<b>30. / 31.</b>			<b>Limits 1 / 2</b>						
300 / 310	Lang6	8515 / 8519	Start/stop speed 1 / 2	0 – 150 [rpm]					
301 / 311		8516 / 8520	Minimum speed 1 / 2	0 – <b>15</b> – 5500 [rpm]					
302 / 312	Lang6	8517 / 8521	Maximum speed 1 / 2	0 – <b>1500</b> – 5500 [rpm]					
303 / 313		8518 / 8522	Current limit 1 / 2	0 – <b>150</b> [% I <sub>N</sub> ]					



No.	FBG	Index dec.	Name	Range / factory setting	Value after startup					
			Display	MOVITOOLS® MotionStudio						
<b>32. / 33.</b>			<b>Motor adjustment 1 / 2</b>							
320 / 330	Long6	8523 / 8528	Automatic adjustment 1/2	Off On	Off On					
321 / 331		8524 / 8529	Boost 1 / 2	0 – 100 [%]						
322 / 332		8525 / 8530	IxR compensation 1/2	0 – 100 [%]						
323 / 333		8526 / 8531	Premagnetization time 1 / 2	0 – 2 [s]						
324 / 334		8527 / 8532	Slip compensation 1 / 2	0 – 500 [rpm]						
<b>34.</b>			<b><math>I_N</math> UL monitoring</b>							
345 / 346	Long6	9114 / 9115	$I_N$ UL monitoring 1/2	0.1 – 500 A						
<b>4..</b>			<b>Reference signals</b>							
<b>40.</b>			<b>Speed reference signal</b>							
400	Long6	8539	Speed reference value	0 – 750 – 5000 [rpm]						
401		8540	Hysteresis	0 – 100 – +500 [rpm]						
402		8541	Delay time	0 – 1 – 9 [s]						
403		8542	Signal = "1" if	0 1	$n < n_{ref}$ $n > n_{ref}$					
<b>43.</b>			<b>Current reference signal</b>							
430	Long6	8550	Current reference value	0 – 100 – 150 % $I_N$						
431		8551	Hysteresis	0 – 5 – 30 % $I_N$						
432		8552	Delay time	0 – 1 – 9 s						
433		8553	Signal = "1" when	0 1	$I < I_{ref}$ $I > I_{ref}$					
<b>44.</b>			<b><math>I_{max}</math> signal</b>							
440	Long6	8554	Hysteresis	0 – 5 – 50 % $I_N$						
441		8555	Delay time	0 – 1 – 9 s						
442		8556	Signal = "1" when	0 1	$I < I_{max}$ $I > I_{max}$					
<b>45.</b>			<b>PI controller reference signal</b>							
450	Long6	8813	PI actual value reference	0.0 – 100.0 %						
451		8796	Signal = "1" if	0 1	PI Actual value < PI ref <b>PI Actual value &gt; PI ref</b>					
<b>5..</b>			<b>Control functions</b> (on FBG only parameter set 1)							
<b>50.</b>			<b>Speed monitoring 1 / 2</b>							
500 / 502	Long6	8557 / 8559	Speed monitoring 1 / 2	0 3	Off Motor/regenerative					
501 / 503		8558 / 8560	Deceleration time 1/2	0 – 1 – 10 [s]						



## Startup

### Parameter list

No.	FBG	Index dec.	Name	Range / factory setting	Value after startup		
				Display	MOVITOOLS® MotionStudio		
<b>54.</b>			<b>Gear unit/motor monitoring</b>				
540	Long	9284	Response to drive vibration / warning		Factory setting: Display error		
541		9285	Response to drive vibration / fault		Factory setting: Rapid stop/warning		
542		9286	Response to oil aging / fault		Factory setting: Display error		
543		9287	Response to oil aging/ warning		Factory setting: Display error		
544		9288	Oil aging / overtemperature		Factory setting: Display error		
545		9289	Oil aging / ready signal		Factory setting: Display error		
549		9290	Response to brake wear		Factory setting: Display error		
<b>56.</b>			<b>Current limit Ex-e motor:</b>				
560	Long	9293	Current limit Ex-e motor	ON / OFF			
561		9294	Frequency A	0 – 5 – 60 Hz			
562		9295	Current limit A	0 – 50 – 150 %			
563		9296	Frequency B	0 – 10 – 104 Hz			
564		9297	Current limit B	0 – 80 – 200 %			
565		9298	Frequency C	0 – 25 – 104 Hz			
566		9299	Current limit C	0 – 100 – 200 %			
<b>6..</b>			<b>Terminal assignment</b>				
<b>60.</b>			<b>Binary inputs</b>				
601	Short	8336	Binary input DI02 assignment	0: No function 1: Enable / stop (factory setting DI03)			
602		8337	Binary input DI03 assignment	2: CW/halt 3: CCW / halt (factory setting DI02)			
603		8338	Binary input DI04 assignment	4: n11/n21 (factory setting DI04) 5: n12/n22 (factory setting DI05)			
604		8339	Binary input DI05 assignment	n13 = n11 + n12 6: Fixed setpoint switchover			
608		8844	Binary input DI00 assignment	7: Parameter set switchover 8: Ramp switchover 9: Motor potentiometer up			
<b>61.</b>			<b>Binary inputs option</b>				
610	Short	8340	Binary input DI10 assignment	10: Motor potentiometer down 11: /External fault			
611		8341	Binary input DI11 assignment	12: Fault reset (factory setting DI00) 19: Slave free running			
612		8342	Binary input DI12 assignment	20: Setpoint acceptance active 26: TF signal (only with DI05)			
613		8343	Binary input DI13 assignment	27: Vibration/warning 28: Vibration/fault			
614		8344	Binary input DI14 assignment	29: Brake wear 30: Controller inhibit			
615		8345	Binary input DI15 assignment	33: Oil aging/warning 34: Oil aging/fault			
616		8346	Binary input DI16 assignment	35: Oil aging / overtemperature 36: Oil aging/ready			



No.	FBG	Index dec.	Name	Range / factory setting	Value after startup		
				Display MOVITOOLS® MotionStudio			
<b>62.</b>			<b>Binary outputs</b>				
620	Short	8350	Binary output DO01 assignment	0: No function 1: /Fault (factory setting DO01)			
621		8351	Binary output DO02 assignment	2: Ready (factory setting DO03) 3: Output stage ON			
622		8916	Binary output DO03 assignment	4: Rotating field ON 5: Brake released (factory setting DO02 / not with DO03) 8: Parameter set 9: Speed reference message 11: Setpoint-actual value comparison signal 12: Current reference signal 13: Imax signal 21: IPOS output 22: /IPOS fault 23: PI controller actual value reference 24: Ex-e current limit active (in preparation) 27: Safe stop 30: Ixt warning 31: Ixt fault			
<b>64.</b>			<b>Analog outputs AO1 (optional)</b>				
640	Long	8568	AO1 analog output	0 1 2 3 4 5 6 7 11 12	<b>No function</b> Ramp generator input Setpoint speed Actual speed Actual frequency Output current Active current Unit utilization Actual speed (signed) Actual frequency (signed)		
641		10248.5	AO1 reference	0 1 2	<b>3000 rpm, 100 Hz, 150 %</b> $n_{max}$ $n_{set\ reference}$		
642		8570	AO1 Operating mode	0 2 3 4	<b>No function</b> 0 – 20 mA 4 – 20 mA 0 – 10 V		
646	Long	10246.1	AO1 Characteristic curve x1	-100 % – <b>0</b> – +100 %			
647		10246.2	AO1 Characteristic curve y1	<b>0</b> – 100 %			
648		10246.3	AO1 Characteristic curve x2	-100 % – 0 – <b>+100</b> %			
649		10246.4	AO1 Characteristic curve y2	<b>0</b> – 100 %			



## Startup

### Parameter list

No.	FBG	Index dec.	Name	Range / factory setting	Display	MOVITOOLS® MotionStudio	Value after startup
7..			<b>Control functions</b> (on FBG only parameter set 1)				
70.			<b>Operating modes 1 / 2</b>				
700 / 701		8574 / 8575	Operating mode 1/2	0 2 3 4 <b>21</b> 22	VFC VFC & Hoist VFC & DC braking VFC & flying start function <b>V/f characteristic curve</b> V/f & DC braking		
71.			<b>Standstill current 1 / 2</b>				
710 / 711		8576 / 8577	Standstill current 1/2	<b>0 – 50 % I<sub>Mot</sub></b>			
72.			<b>Setpoint stop function 1 / 2</b>				
720 / 723		8578 / 8581	Setpoint stop function 1/2	<b>Off</b> On	<b>Off</b> On		
721 / 724		8579 / 8582	Stop setpoint 1/2	<b>0 – 30 – 500 [rpm]</b>			
722 / 725		8580 / 8583	Start offset 1/2	<b>0 – 30 – 500 [rpm]</b>			
73.			<b>Brake function 1/2</b>				
731 / 734		8749 / 8750	Brake release time 1/2	<b>0 – 2 [s]</b>			
732 / 735		8585 / 8587	Brake application time 1/2	<b>0 – 2 [s]</b>			
74.			<b>Speed skip function</b>				
740 / 742		8588 / 8590	Skip window center 1/2	<b>0 – 1500 – 5000 rpm</b>			
741 / 743		8589 / 8591	Skip width 1/2	<b>0 – 300 rpm</b>			
75.			<b>Master/slave function</b>				
750		8592	Slave setpoint				
751		8593	Scaling slave setpoint				
76.			<b>Manual operation</b>				
760		8798	Lock RUN/STOP keys	<b>Off</b> On	<b>Off</b> On		
77.			<b>Energy-saving function</b>				
770		8925	Energy-saving function	<b>Off</b> On	<b>Off</b> On		
8..			<b>Unit functions</b> (on FBG only parameter set 1)				
80.			<b>Setup</b>				
800		–	Quick menu	<b>long</b> <b>short</b>			
801		–	DBG language				
802		8594	Factory setting	<b>No</b> Hours ALL NEMA	<b>0 / No</b> 1 / Standard 2 / Delivery status 4 / NEMA delivery status		
803		8595	Parameter lock	<b>Off</b> On	<b>Off</b> On		



No.	FBG	Index dec.	Name	Range / factory setting	Display	MOVITOOLS® MotionStudio	Value after startup
804		8596	Reset statistics data	<b>No action</b> Fault memory			
805		–	Rated mains voltage	50 – 500 V			
806		–	Copy DBG → MOVITRAC® B	Yes <b>No</b>			
807		–	Copy MOVITRAC® B → DBG	Yes <b>No</b>			
808		8660	24 V output voltage	<b>Off</b> On			
809		10204.1	IPOS enable	<b>Off</b> On			
<b>81.</b>			<b>Serial communication</b>				
810	Long6	8597	RS-485 address	<b>0 – 99</b>			
811		8598	RS-485 group address	<b>100 – 199</b>			
812		8599	RS-485 timeout interval	<b>0 – 650 [s]</b>			
<b>82.</b>			<b>Brake operation 1 / 2</b>				
820 / 821	■	8607 / 8608	4-quadrant operation 1/2	Off <b>On</b>	Off <b>On</b>		
<b>83.</b>			<b>Error responses</b>				
830	Long6	8609	Response terminal "external fault"	2 <b>4</b>	Immediate stop / fault <b>Rapid stop / fault</b> (830) <b>Rapid stop / warning</b> (833 / 836)		
833		8612	Response to RS-485 timeout	7			
836		8615	Response to SBus timeout				
<b>84.</b>			<b>Reset behavior</b>				
840		8617	Manual reset		Yes <b>No</b>		
841		8618	Auto reset		Off On		
842		8619	Restart time		<b>1 – 3 – 30 s</b>		
<b>85.</b>			<b>Scaling actual speed value</b>				
850	Long6	8747	Scaling factor numerator	<b>1 – 65535</b> ( can be set with SHELL only)			
851		8748	Scaling factor denominator	<b>1 – 65535</b> ( can be set with SHELL only)			
852		8772 / 8773	User-defined unit	Text			
853		9312	Scaled speed FBG	0 1	<b>Speed</b> Scaled speed		
<b>86.</b>			<b>Modulation 1 / 2</b>				
860 / 861	Long6	8620 / 8621	PWM frequency 1/2	4 8 12 16	<b>4 kHz</b> 8 kHz 12 kHz 16 kHz		
862 / 863		8751 / 8752	PWM fix 1/2	On Off	On Off		



## Startup

### Parameter list

No.	FBG	Index dec.	Name	Range / factory setting	Value after startup		
				Display	MOVITOOLS® MotionStudio		
<b>87.</b>			<b>Process data parameter setting</b>				
870	Long6	8304	Setpoint description PO1	<b>No function</b> (factory setting P872) <b>Setpoint speed</b> (factory setting P871) Max. speed Ramp <b>Control word 1</b> (factory setting P870) Control word 2 Setpoint speed [%] IPOS PO data PI controller setpoint [%]			
871		8305	Setpoint description PO2				
872		8306	Setpoint description PO3				
873	Long6	8307	Actual value description PI1	No function <b>Actual speed</b> (factory setting P874) <b>Output current</b> (factory setting P875) Active current <b>Status word 1</b> (factory setting P873) Actual speed [%] IPOS PI-DATA PI controller actual value [%]			
874		8308	Actual value description PI2				
875		8309	Actual value description PI3				
876	Long6	8622	Enable PO data	No Yes			
<b>88.</b>			<b>Serial communication SBus</b>				
880	Long6	8937	SBus protocol	<b>0 / MoviLink</b> 1 / CANopen			
881		8600	SBus address	<b>0 – 63</b>			
882		8601	SBus group address	<b>0 – 63</b>			
883	Long6	8602	SBus timeout interval	<b>0 – 650 [s]</b>			
884		8603	SBus baud rate	125 250 <b>500</b> 1000	125 kBd 250 kBaud <b>500 kBaud</b> 1 MBaud		
886		8989	CANopen address	<b>1 – 2 – 127</b>			



## 5 Operation

### 5.1 Return codes (r-19 – r-38)

MOVITRAC® B return codes:

No.	Designation	Meaning
19	Parameter lock activated	Parameters cannot be changed
20	Factory setting in progress	Parameters cannot be changed
23	Option card missing	The option card required for the function is missing.
27	Option card missing	The option card required for the function is missing.
28	Controller inhibit required	Controller inhibit required
29	Invalid value for parameter.	<ul style="list-style-type: none"> <li>Invalid value for parameter.</li> <li>FGB manual operation selection invalid as PC is in active manual operation.</li> </ul>
32	Enable	You cannot perform this function in ENABLED status
34	Error during execution	<ul style="list-style-type: none"> <li>Error while saving in FBG11B.</li> <li>Startup not performed with FBG. Perform FGB startup with MotionStudio or select a new motor.</li> </ul>
38	FBG11B incorrect data set	Stored data set does not match the unit

### 5.2 Unit status codes

Use status word 1 to determine the unit status code.

Code	Meaning
0x0	Not ready
0x1	Controller inhibit
0x2	No enable
0x3	Standstill current active, no enable
0x4	Enable
0x8	Factory setting is active



## 6 Service / List of Faults

### 6.1 Unit information

#### 6.1.1 Fault memory

The inverter stores the error message in fault memory P080. The inverter does not save a new fault until the error message has been acknowledged. The local operating panel shows the most recent fault. Whenever double faults occur, the value stored in P080 does not correspond to the value displayed on the operating panel. This is an example of what happens with F-07 DC link overvoltage followed by F34 Ramp timeout.

The inverter stores the following information when a malfunction occurs:

- Error occurred
- Status of the binary inputs / binary outputs
- Operating status of the inverter
- Inverter status
- Heat sink temperature
- Speed
- Output current
- Active current
- Unit utilization
- DC link voltage

#### 6.1.2 Reset

*Interface reset*

An error message can be acknowledged by:

- Manual reset in MOVITOOLS® MotionStudio / P840 Manual reset = Yes, or in the status window of the reset button.

## 6.2 List of faults (F-00 – F-113)

No.	Designation	Response	Possible cause	Measure
00	No error			
01	Overcurrent	Immediate switch-off with inhibit.	• Short circuit on output	• Rectify the short circuit
			• Switching on output	• Switching with inhibited output stage only
			• Motor too large	• Connect a smaller motor
			• Faulty output stage	• Consult SEW Service if the error cannot be reset
03	Ground fault	Immediate switch-off with inhibit.	• Ground fault in motor	• Replace motor
			• Ground fault in inverter	• Replace MOVITRAC® B
			• Ground fault in the motor supply lead	• Eliminate ground fault
			• Overcurrent (see F-01)	• See F-01



No.	Designation	Response	Possible cause	Measure
04	Brake chopper	Immediate switch-off with inhibit.	<ul style="list-style-type: none"> <li>Too much regenerative power</li> <li>Braking resistor circuit interrupted</li> <li>Short circuit in the braking resistor circuit</li> <li>Brake resistor resistance too high</li> <li>Brake chopper defective</li> <li>Ground fault</li> </ul>	<ul style="list-style-type: none"> <li>Extend deceleration ramps</li> <li>Check supply cable to the braking resistor</li> <li>Rectify the short circuit</li> <li>Check technical data of braking resistor</li> <li>Replace MOVITRAC® B</li> <li>Eliminate ground fault</li> </ul>
06	Mains phase failure	Immediate switch-off with inhibit (only with 3-phase inverter)	<ul style="list-style-type: none"> <li>Phase failure</li> <li>Supply voltage too low</li> </ul>	<ul style="list-style-type: none"> <li>Check the supply system lead</li> <li>Check the supply voltage</li> </ul>
07	DC link over-voltage	Immediate switch-off with inhibit.	<ul style="list-style-type: none"> <li>DC link voltage too high</li> <li>Ground fault</li> </ul>	<ul style="list-style-type: none"> <li>Extend deceleration ramps</li> <li>Check supply cable to the braking resistor</li> <li>Check technical data of braking resistor</li> <li>Eliminate ground fault</li> </ul>
08	Speed monitoring	Immediate switch-off with inhibit.	<p>Current controller works at the set limit due to:</p> <ul style="list-style-type: none"> <li>Mechanical overload</li> <li>Phase failure in supply system</li> <li>Phase failure in motor</li> <li>Maximum speed for VFC operating modes exceeded</li> </ul>	<ul style="list-style-type: none"> <li>Reduce load</li> <li>Check current limitation</li> <li>Extend deceleration ramps</li> <li>Increase P501 deceleration time setting<sup>1)</sup></li> <li>Check mains phases</li> <li>Check motor cable and motor</li> <li>Reduce maximum speed</li> </ul>
09	Startup	Immediate switch-off with inhibit.	<ul style="list-style-type: none"> <li>Inverter not started yet</li> <li>Unknown motor selected</li> </ul>	<ul style="list-style-type: none"> <li>Start up the inverter</li> <li>Select another motor</li> </ul>
10	IPOS-ILLOP	Stop with inhibit With IPOS only	<ul style="list-style-type: none"> <li>Wrong command during program execution</li> <li>Incorrect conditions during program execution.</li> <li>Function does not exist / is not implemented in the inverter</li> </ul>	<ul style="list-style-type: none"> <li>Check the program</li> <li>Check program run</li> <li>Use another function</li> </ul>
11	Over-temperature	Stop with inhibit	<ul style="list-style-type: none"> <li>Thermal overload of inverter</li> </ul>	<ul style="list-style-type: none"> <li>Reduce load and/or ensure adequate cooling</li> <li>If a braking resistor is integrated in the heat sink: Install braking resistor externally</li> </ul>
17 ... 24	System malfunction	Immediate switch-off with inhibit.	<ul style="list-style-type: none"> <li>Inverter electronics is faulty, possibly due to EMC influence</li> </ul>	<ul style="list-style-type: none"> <li>Check grounding and shielding and improve, if necessary.</li> <li>Contact SEW Service for advice if this fault reoccurs.</li> </ul>



## Service / List of Faults

### List of faults (F-00 – F-113)

No.	Designation	Response	Possible cause	Measure
25	EEPROM	Stop with inhibit	<ul style="list-style-type: none"> <li>Fault while accessing EEPROM</li> </ul>	<ul style="list-style-type: none"> <li>Activate factory settings, perform reset and reset parameters.</li> <li>Contact SEW Service for advice if this fault reoccurs.</li> </ul>
26	External terminal	Programmable	<ul style="list-style-type: none"> <li>Read in external fault signal via programmable input.</li> </ul>	<ul style="list-style-type: none"> <li>Eliminate respective cause; reprogram terminal if necessary.</li> </ul>
31	TF/TH sensor tripped	Stop with inhibit	<ul style="list-style-type: none"> <li>Motor too hot, TF sensor has tripped</li> </ul>	<ul style="list-style-type: none"> <li>Let motor cool off and reset error</li> </ul>
			<ul style="list-style-type: none"> <li>TF sensor of motor not connected or connected incorrectly</li> <li>Connection of MOVITRAC® B and TF on motor interrupted</li> </ul>	<ul style="list-style-type: none"> <li>Check connections / links between MOVITRAC® B and TF</li> </ul>
32	IPOS index overflow	Stop with inhibit	<ul style="list-style-type: none"> <li>Programming principles violated leading to internal stack overflow</li> </ul>	<ul style="list-style-type: none"> <li>Check user program and correct it</li> </ul>
34	Ramp timeout	Immediate switch-off with inhibit.	<ul style="list-style-type: none"> <li>Set ramp time exceeded.</li> </ul>	<ul style="list-style-type: none"> <li>Extend the ramp time</li> </ul>
			<ul style="list-style-type: none"> <li>If you remove the inhibit and the drive exceeds the stop ramp time t13 by a certain time, the inverter will signal F34.</li> </ul>	<ul style="list-style-type: none"> <li>Extend the stop ramp time</li> </ul>
35	Ex-e protection operating mode	programmable	<ul style="list-style-type: none"> <li>Wrong operating mode selected</li> </ul>	<ul style="list-style-type: none"> <li>Permitted modes:           <ul style="list-style-type: none"> <li>V/f, VFC, VFC hoist</li> <li>Non-permitted modes:               <ul style="list-style-type: none"> <li>Flying start function</li> <li>DC braking</li> <li>Group operation</li> </ul> </li> </ul> </li> </ul>
			<ul style="list-style-type: none"> <li>Non-permitted parameter set</li> </ul>	<ul style="list-style-type: none"> <li>Use parameter set 1 only</li> </ul>
			<ul style="list-style-type: none"> <li>No Ex-e motor taken into operation</li> </ul>	<ul style="list-style-type: none"> <li>Take Ex-e motor into operation</li> </ul>
			<ul style="list-style-type: none"> <li>Incorrectly parameterized frequency points</li> </ul>	<ul style="list-style-type: none"> <li>Frequency A &lt; frequency B</li> <li>Frequency B &lt; frequency C</li> </ul>
			<ul style="list-style-type: none"> <li>Current limits not set correctly</li> </ul>	<ul style="list-style-type: none"> <li>Current limit A &lt; current limit B</li> <li>Current limit B &lt; current limit C</li> </ul>
			<ul style="list-style-type: none"> <li>Type of option card not allowed</li> </ul>	<ul style="list-style-type: none"> <li>Use correct option card</li> </ul>
36	Option missing	Immediate switch-off with inhibit.	<ul style="list-style-type: none"> <li>Setpoint source, control signal source or operating mode not permitted for this option card</li> </ul>	<ul style="list-style-type: none"> <li>Set correct setpoint source.</li> <li>Set correct control signal source</li> <li>Set the correct operating mode.</li> <li>Check parameters P120 and P121</li> </ul>
			<ul style="list-style-type: none"> <li>Required option missing</li> </ul>	<ul style="list-style-type: none"> <li>Check the following parameters:           <ul style="list-style-type: none"> <li>P121 for FBG11B</li> <li>P120 and P642 for FIO12B</li> </ul> </li> </ul>
37	System watchdog	Immediate switch-off with inhibit.	<ul style="list-style-type: none"> <li>Fault in system software sequence</li> </ul>	<ul style="list-style-type: none"> <li>Check grounding and shielding and improve, if necessary.</li> <li>Contact SEW Service for advice if this fault reoccurs.</li> </ul>
38	System software	Immediate switch-off with inhibit.	<ul style="list-style-type: none"> <li>System malfunction</li> </ul>	<ul style="list-style-type: none"> <li>Check grounding and shielding and improve, if necessary.</li> <li>Contact SEW Service for advice if this fault reoccurs.</li> </ul>



No.	Designation	Response	Possible cause	Measure
43	RS-485 timeout	Stop without inhibit <sup>2)</sup>	• Connection between inverter and PC interrupted.	• Check connection between inverter and PC.
44	Unit utilization	Immediate switch-off with inhibit.	• Unit utilization (Ixt value) exceeded	• Decrease power output • Extend ramps • If mentioned points not possible: Use a larger inverter
45	Initialization	Immediate switch-off with inhibit.	• Error during initialization	• Contact SEW Service for advice.
47	System bus 1 timeout	Stop without inhibit	• Fault during communication via system bus	• Check system bus connection
77	IPOS control word	Stop with inhibit	• System malfunction	• Contact SEW Service for advice.
80	RAM test	Immediate disconnection	Internal unit fault, RAM defective.	Contact SEW Service.
81	Start condition	Immediate switch-off with inhibit.	<b>Only in "VFC hoist" operating mode:</b> The motor could not be supplied with the correct amount of current during the pre-magnetizing time: <ul style="list-style-type: none"> <li>Rated motor power too small in relation to rated inverter power</li> <li>Motor cable cross section too small</li> </ul>	<ul style="list-style-type: none"> <li>Check connection between inverter and motor</li> <li>Check startup data and perform new startup, if necessary.</li> <li>Check cross section of motor cable and increase if necessary.</li> </ul>
82	Open output	Immediate switch-off with inhibit.	<b>Only in "VFC hoist" operating mode:</b> <ul style="list-style-type: none"> <li>2 or all output phases interrupted</li> <li>Rated motor power too small in relation to rated inverter power</li> </ul>	<ul style="list-style-type: none"> <li>Check connection between inverter and motor</li> <li>Check startup data and perform new startup, if necessary.</li> </ul>
84	Motor protection	Stop with inhibit	• Motor utilization too high.	<ul style="list-style-type: none"> <li>Check P345/346 <math>I_N</math> UL monitoring</li> <li>Reduce load</li> <li>Extend ramps</li> <li>Longer pause times</li> </ul>
94	EEPROM checksum	Immediate switch-off with inhibit.	• Defective EEPROM	• Contact SEW Service.
97	Copy error	Immediate switch-off with inhibit.	<ul style="list-style-type: none"> <li>Parameter module is removed during copying process</li> <li>Switching off/on during copying process</li> </ul>	Prior to confirming the error: <ul style="list-style-type: none"> <li>Load factory setting or complete data set from parameter module</li> </ul>
98	CRC error flash	Immediate disconnection	Internal unit fault Flash memory defective.	Send unit in for repair.
100	Vibration/warning	Display error	Vibration sensor warning (→ "DUV10A" operating instructions)	Determine cause of vibrations. Continue operation until F101 occurs.
101	Oscillation fault	Rapid stop	Vibration sensor signals fault	SEW-EURODRIVE recommends that you remedy the cause of the vibrations immediately
102	Oil aging/warning	Display error	Oil aging sensor warns	Schedule oil change



## Service / List of Faults

### List of faults (F-00 – F-113)

No.	Designation	Response	Possible cause	Measure
103	Oil aging/fault	Display error	Oil aging sensor signals fault	SEW-EURODRIVE recommends that you change the gear unit oil immediately.
104	Oil aging/over-temperature	Display error	Oil aging sensor signals over-temperature	<ul style="list-style-type: none"> <li>Let oil cool down</li> <li>Check if the gear unit cools properly</li> </ul>
105	Oil aging / ready signal	Display error	Oil aging sensor is not ready for operation	<ul style="list-style-type: none"> <li>Check voltage supply of oil aging sensor</li> <li>Check and, if necessary, replace the oil aging sensor</li> </ul>
106	Brake wear	Display error	Brake lining worn down	Replace brake lining (→ "Motors" operating instructions)
110	"Ex-e protection" fault	Stop with inhibit	Duration of operation below 5 Hz exceeded	<ul style="list-style-type: none"> <li>Check project planning</li> <li>Shorten duration of operation below 5 Hz</li> </ul>
113	Analog input open circuit	programmable	AI1 analog input open circuit	<ul style="list-style-type: none"> <li>Check the wiring</li> </ul>
116	"Timeout MOVI-PLC" fault	Rapid stop/warning	MOVI-PLC® communication time-out	<ul style="list-style-type: none"> <li>Check startup</li> <li>Check wiring</li> </ul>

- 1) Speed monitoring is set by changing parameters 500 / 502 and 501 / 503. The sagging of hoists cannot be avoided safely when monitoring is deactivated or the delay time is set too long.
- 2) No reset required, error message disappears after communication is reestablished

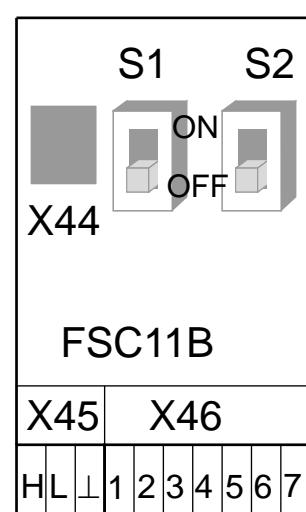
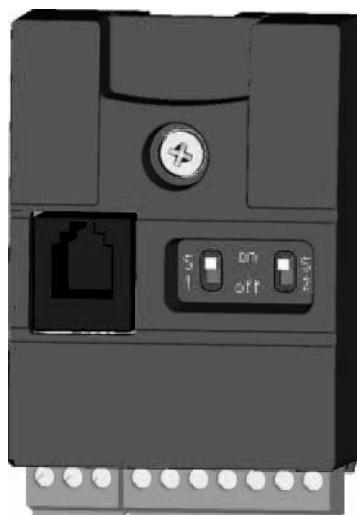


## 7 Technical Data

### 7.1 FSC11B communication module

The FSC11B communication module enables communication with other units. These may include: PC, operator terminals, MOVITRAC® or MOVIDRIVE®.

Part number	1820 716 2
Functions	<ul style="list-style-type: none"> <li>Communication with PLC / MOVITRAC® B / MOVIDRIVE® / PC</li> <li>Operation / parameter setting / service (PC)</li> <li>The options FSC11B and FIO11B are installed at the same fastening place and therefore cannot be used simultaneously.</li> </ul>
Features	<ul style="list-style-type: none"> <li>RS-485 (one interface): Plug-in terminals and service interface (RJ10 socket)</li> <li>CAN-based system bus (SBus) (plug-in terminals)</li> <li>Supported protocols: MOVILINK® / SBus / RS-485 / CANopen</li> </ul>



Function	Terminal	Designation	Data
System bus (SBus)	X46:1 X46:2 X46:3 X46:4 X46:5 X46:6 X46:7	SC11: SBus High SC12: SBus Low GND: Reference potential SC21: SBus High SC22: SBus Low GND: Reference potential 24VIO: Auxiliary voltage / external voltage supply	CAN bus according to CAN specification 2.0, parts A and B, transmission technology according to ISO 11898, max. 64 stations, terminating resistor (120 Ω) can be activated using DIP switch <b>S1</b> . Terminal cross-section: 1.5 mm <sup>2</sup> (AWG15) without conductor end sleeves 1.0 mm <sup>2</sup> (AWG17) with conductor end sleeves
RS-485 interface	X45:H X45:L X45:?  X44 RJ10	ST11: RS-485+ ST12: RS-485- GND: Reference potential  Service interface	EIA standard, 9.6 kBaud, max. 32 stations Maximum cable length 200 m (656 ft) Dynamic terminating resistor with fixed installation Terminal cross-section: – 1.5 mm <sup>2</sup> (AWG15) without conductor end sleeves – 1.0 mm <sup>2</sup> (AWG17) with conductor end sleeves Connection: Only for service purposes, exclusively for point-to-point connection Maximum cable length 3 m (10 ft)



## 7.2 FIO11B analog module

Part number 1820 637 9

### 7.2.1 Description

The FIO11B analog module upgrades the basic version with the following interfaces:

- Setpoint input
- Analog output
- RS-485 interface
- The options FIO11B, FSC11B and FIO21B are mounted on the same fastening place and therefore cannot be used simultaneously.



### 7.2.2 Electronics data FIO11B analog module

Function	Terminal	Designation	Data
Setpoint input <sup>1)</sup>	X40:1 X40:2	AI2: Voltage input GND: Reference potential	-10 – +10 V $R_i > 40 \text{ k}\Omega$ Resolution 10 bit Sampling time 5 ms
Analog output / alternative as current output or voltage output	X40:3 X40:4 X40:5	GND: Reference potential AOV1: Voltage output AOC1: Current output	0 – +10 V / $I_{max} = 2 \text{ mA}$ 0 (4) – 20 mA Resolution 10 bit Sampling time 5 ms Short-circuit proof, protected against external voltage up to 30 V Load impedance $R_L \leq 750 \Omega$
RS-485 interface	X45:H X45:L X45:?  X44 RJ10	ST11: RS-485+ ST12: RS-485- GND: Reference potential  Service interface	EIA standard, 9.6 kBaud, max. 32 stations Maximum cable length 200 m (656 ft) Dynamic terminating resistor with fixed installation Terminal cross-section: – 1.5 mm <sup>2</sup> (AWG15) without conductor end sleeves – 1.0 mm <sup>2</sup> (AWG17) with conductor end sleeves Connection: Only for service purposes, solely for point-to-point connection Maximum cable length 3 m (10 ft)

1) If the setpoint input is not used, it should be set to GND. Otherwise a measured input voltage of -1 V ... +1 V is set.



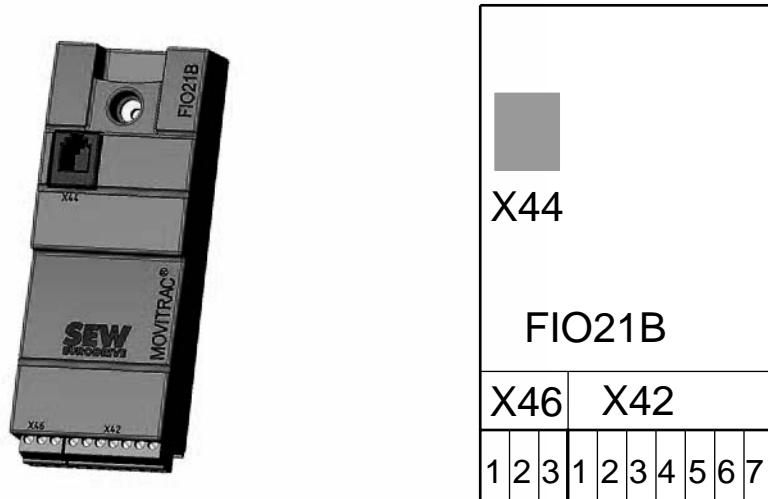
## 7.3 FIO21B digital module

Part number 1822 541 1

### 7.3.1 Description

The FIO21B digital module upgrades the basic unit with the following interfaces:

- 7 additional binary inputs DI10 – DI16
- RS-485 service interface
- CAN-based system bus (SBus), plug-in terminals
- The options FIO11B, FSC11B and FIO21B are mounted on the same fastening place and therefore cannot be used simultaneously.



### 7.3.2 Electronics data of the FIO21B digital module

Function	Terminal	Designation	Data
Binary inputs	X42:1 X42:2 X42:3 X42:4 X42:5 X42:6 X42:7	DI10 DI11 DI12 DI13 DI14 DI15 DI16	$R_i = 3 \text{ k}\Omega$ , $IE = 10 \text{ mA}$ , sampling interval 5 ms, PLC compatible Signal level according to EN 61131-2 type 1 or 3: • +11 V – +30 V: Contact closed • -3 V – +5 V: Contact open Factory set to "no function"
Service interface	X44 RJ10	Service interface	EIA standard, 9.6 kBaud Connection: Only for service purposes, solely for point-to-point connection Maximum cable length 3 m (10 ft)
System bus (SBus)	X46:1 X46:2 X46:3	SC11: CAN High SC12: CAN Low GND: Reference potential	CAN bus to CAN specification 2.0, parts A and B Transmission technology according to ISO 11898, max. 64 stations Bus termination possible between SC11 and SC12 with enclosed 120 $\Omega$ resistor. Terminal cross-section: • 1.5 mm <sup>2</sup> (AWG15) without conductor end sleeves • 1.0 mm <sup>2</sup> (AWG17) with conductor end sleeves



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